

The background is a light blue gradient with several realistic water droplets of various sizes scattered across the surface. The droplets have highlights and shadows, giving them a three-dimensional appearance.

STORMWATER BMP MAINTENANCE

DRAINAGE DOCTOR, LLC

NATHAN MINOR

BMP'S

UNDERGROUND

SUMP

STORMCEPTOR

*LARGE UNDERGROUND
STORAGE*

VEGETATIVE

INFILTRATION BASIN

RETENTION BASIN

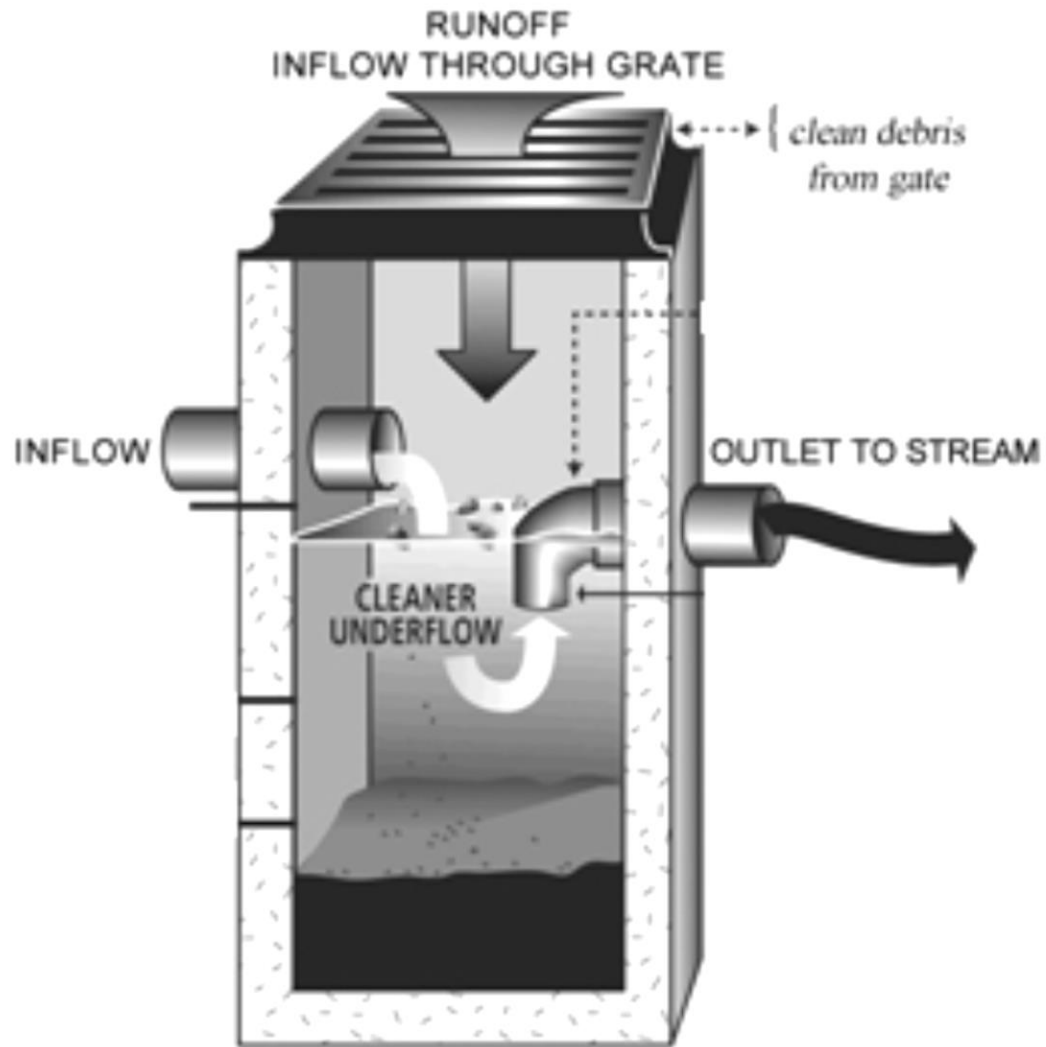
DETENTION BASIN

RAIN GARDEN

FILTER MEDIA

UP-FLO FILTER

CATCH BASIN FILTER

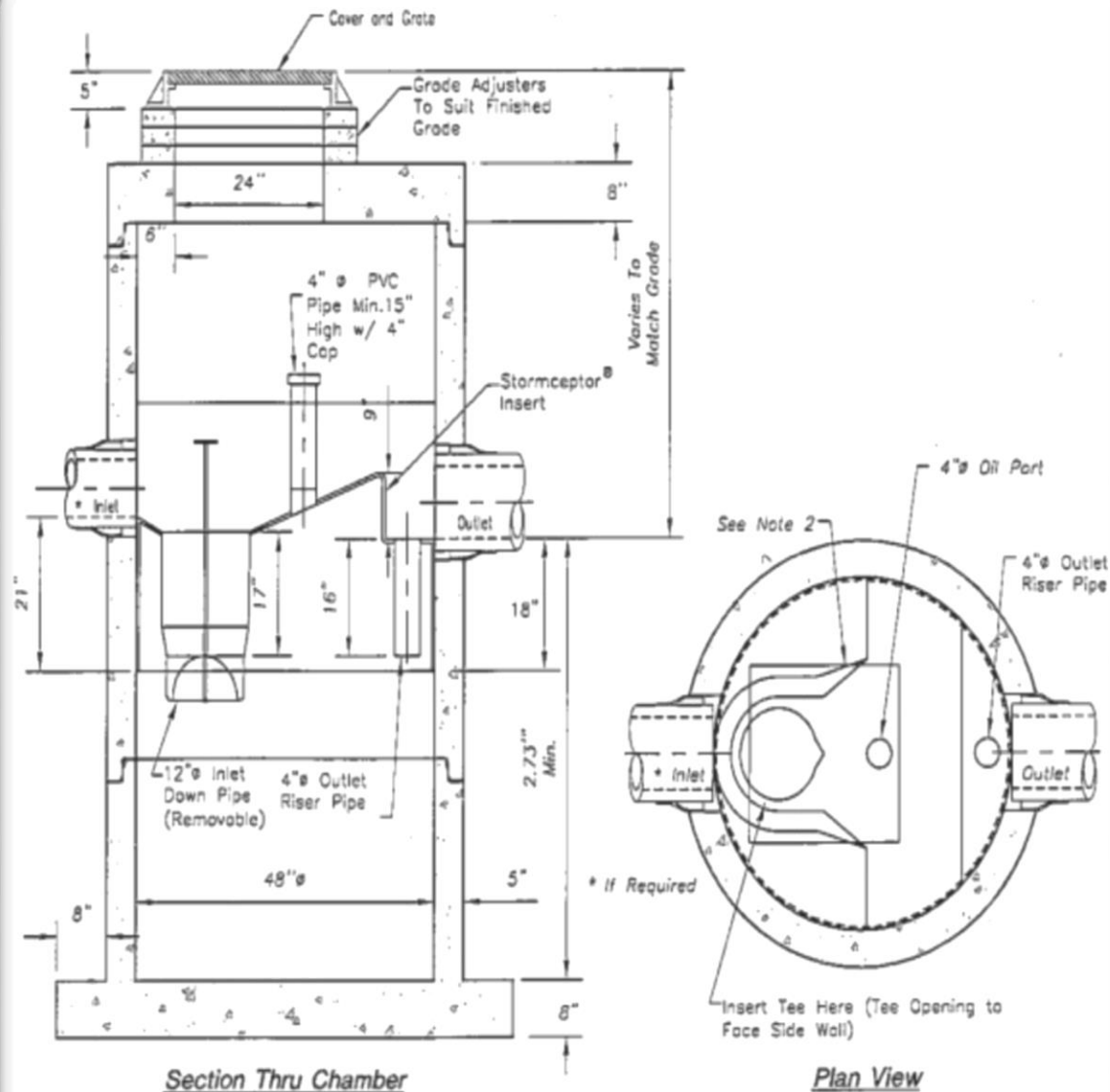


SUMP

- EASY INSPECTION – PROFESSIONAL MAINTENANCE
 - MEASURE SEDIMENT DEPTH.
 - VACUUM SEDIMENT AND KEEP LID CLEAN.
- COST
 - INSPECTION COST – DEPENDS ON INSPECTOR AND OTHER BMP'S. CAN BE DONE BY OWNER.
 - CLEANING COST - \$95 AND UP
- HELPFUL TIPS
 - VACUUM SUMP PRIOR TO FIRST INSPECTION FOR BASELINE MEASURE

STORMCEPTOR

- EASY INSPECTION – PROFESSIONAL MAINTENANCE
 - MEASURE SEDIMENT
 - CLEAN DEBRIS OFF STORMCEPTOR INSERT
 - VACUUM OIL AND GREASE PORT AND SUMP AS REQUIRED.
- COST
 - FOR INSPECTION IT DEPENDS ON INSPECTOR AND OTHER BMP'S ON SITE. CAN BE DONE BY OWNER WITH LITTLE INSTRUCTION.
 - CLEANING COSTS - \$250 AND UP DEPENDING ON VOLUME.
- PICTURES









LARGE UNDERGROUND STORAGE DEVICES

➤ PROFESSIONAL INSPECTION & MAINTENANCE

➤ INSPECTION

- MEASURING DISTANCE TO SEDIMENT FROM OBSERVATION PORTS
- LARGER UNITS CAN REQUIRE VIDEO INSPECTION OR CONFINED SPACE ENTRY INSPECTION
- PRESENTS OF ISOLATOR ROWS AND COLLECTION POINTS CAN MAKE INSPECTIONS EASIER

➤ MAINTENANCE

- LARGE VAC TRUCKS AND JETTING EQUIPMENT ARE USUALLY REQUIRED.
- CONFINED SPACE ENTRY CAN BE NEEDED FOR LARGER SYSTEMS.
- ISOLATOR ROWS AND COLLECTION POINTS CAN MAKE MAINTENANCE EASIER AND REDUCE COSTS IF DESIGNED AS PART OF THE SYSTEM

➤ COST

- MORE MAINTENANCE HISTORY NEEDS TO BE DONE TO REALLY DETERMINE LONG TERM COSTS.
- IF SYSTEMS A SYSTEM WAS DESIGNED WITH A COLLECTION POINT OR ISOLATOR ROW THEN MAINTENANCE COSTS CAN BE BETTER PREDICTED



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WIER PLATE COLLECTION POINT



STORMWATER BASINS



➤ PROFESSIONAL INSPECTION & MAINTENANCE

➤ INSPECTION

- GENERALLY REQUIRES A CIVIL ENGINEER
- LOOKING AT ALL ASPECTS OF BASIN. PLANTS, STRUCTURES, INLETS AND OUTLETS, SLOPES, BERMS, RIP-RAP ECT FOR WOODY VEGETATION, EROSION, OR ANY OTHER DAMAGE.

➤ TOPOGRAPHICAL SURVEY

- DONE EVERY 3 TO 5 YEARS BASED ON VERBIAGE IN STORMWATER MAINTENANCE AGREEMENT
- LOOKING FOR SIGNS OF SEDIMENT ACCUMULATION

➤ MAINTENANCE

➤ ANNUAL PREVENTATIVE MAINTENANCE

- INSPECTION AND MOWING HAVE THE BIGGEST EFFECTS ON THE STORMWATER BASINS.

➤ MAINTENANCE/REPAIRS BASED ON ENGINEERING INSPECTION

➤ MOST COMMON REPAIRS

- REMOVING WOODY VEGETATION
- MOWING
- REPLACING RIP-RAP AND FABRIC
- FIXING EROSION AROUND RIP-RAP
- CATTAILS



AIRPORT ROAD PROJECT

3 LARGE INFILTRATION BASINS

7 YEARS AFTER CONSTRUCTION

1800 SMALL TO LARGE TREES

CLOGGED 1700 SQ FT INFILTRATION BASIN

RIPRAP GROWN OVER

COST OF REPAIR WAS OVER \$50,000

COULD HAVE BEEN AVOIDED WITH MOWING
AND ANNUAL INSPECTION

-2015 GIS PHOTO



SOUTHEAST INFILTRATION BASIN



SOUTHWEST INFILTRATION BASIN



**SOUTHEAST INFILTRATION BASIN
BEFORE AND ALMOST AFTER**



SOUTHWEST INFILTRATION BASIN REPAIR



SOUTHWEST BASIN BEFORE AND AFTER

BEFORE AND AFTER REPAIR





MADISON EAST SIDE PROJECT

3 INFILTRATION BASINS

TOTAL SQUARE FEET DESTROYED - 4528

ORGANIC MATTER FROM BUSINESS WAS
WASHING INTO THE INFILTRATION BASINS

CLOGGING THE INFILTRATION AND
CONTAMINATING THE ENGINEERED SOIL.

COST OF REPAIR WAS \$56000

COST FOR THE INSPECTION TO CATCH THE
ISSUE - \$400

UP-FLO FILTER MODULES

➤ PROFESSIONAL INSPECTION AND MAINTENANCE

➤ INSPECTION

- SUMP BOTTOM FOR SEDIMENT ACCUMULATION
- VISUAL INSPECTION OF MODULE COVERS
- CAN REQUIRE CONFINED SPACE

➤ MAINTENANCE

- VACUUM SUMP BOTTOM IF REQUIRED BASED ON DEPTH OF SUMP TO OUTLET PIPE
- REMOVE COVERS TO MODULES AND REPLACE FILTER MEDIA BAGS AND GREEN MESH.
 - THIS IS RECOMMENDED ANNUALLY BUT CAN BE EXTENDED LONGER IF FILTER MEDIA IS CLEAN AND LIGHT IN WEIGHT.
- CAN REQUIRE CONFINED SPACE ON LARGER VAULT SYSTEMS

➤ COST

- COST FOR SUMP CLEANING IN SMALLER 2 TO 6 UNITS IS COMPARABLE TO A STORMCEPTOR. HOWEVER LARGER VAULT SYSTEMS ARE BASED ON VOLUME REMOVED AND CONFINED SPACE REQUIREMENTS. FOLLOWING A SECOND REGULAR SERVICE WE ARE USUALLY ABLE TO ESTABLISH A BUDGET FOR CUSTOMER.
- FILTER MODULE REPLACEMENT PARTS AND MEDIA COST ABOUT \$500 PER MODULE. PICTURED IS A 2-MODULE SYSTEM SO IT COSTS \$1000 FOR THE MATERIALS.
- LABOR COSTS DEPEND ON CONFINED SPACE REQUIREMENTS AND NUMBER OF MODULES.





UP-FLO

EMPTY MODULE BINS



UP-FLO FILTER MEDIA

CLEAN
VS.
1 YEAR
SERVICE



UP-FLO VAULT SYSTEM







INLET FILTER

➤ PROFESSIONAL MAINTENANCE RECOMMENDED

➤ INSPECTION

- CAN BE DONE BY PROPERTY OWNER
- LOOKING FOR FULL OR TORN BAGS
AND SPENT FILTER MEDIA

➤ MAINTENANCE

- 3 SITE VISITS PER YEAR
- 1 FILTER MEDIA CHANGE PER YEAR

➤ ADVANTAGE

- GREAT OPTION WHEN WATER VOLUME
ISN'T A FACTOR





OUT OF COMPLIANCE



VS.

IN COMPLIANCE

MT HOREB PROJECT

ORIGINAL DESIGN

- 1800SF BIO-SWALE
- COST FOR INSTALLATION \$45000
- ANNUAL MAINTENANCE COST
 - \$400 DOLLAR ANNUAL INSPECTION
 - \$??? MOWING COST
 - \$COST OF ANY FUTURE REPAIRS
- COST IF COMPLETE FAILURE AND REBUILD REQUIRED
 - \$45000

NEW DESIGN

- GRASS SWALE SPLIT INTO TWO SECTIONS WITH 2 STRUCTURES AND INLET FILTERS.
- COST FOR INSTALLATION - \$15000
- ANNUAL MAINTENANCE COST
 - \$480 FOR ANNUAL INSPECTION AND FILTER CLEANING SERVICE WITH MEDIA SWAP
- COST IF COMPLETE FAILURE AND REBUILD REQUIRED
 - \$600

THANK YOU DRAINAGE DOCTOR, LLC



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